

Name Key + 47

Date _____

AP: CHAPTER 1

THEMES IN THE STUDY OF LIFE

- +2 1. Why do biology courses build their content around themes and major concepts?

Biology is too large of a topic to memorize. Themes & Major concepts allow you to organize and make sense of all the information in Biology and develop a coherent view of life

- +9 2. Choose the most appropriate answer for each term

C molecule

E cell

F community

B ecosystem

I organ system

A organ

D Population

H biosphere

G tissue

A. The interaction of two or more tissues to perform a common task

B. The interaction of a community and the physical environment (i.e.- all nonliving things)

C. Two or more atoms bonded together

D. A group of individuals of the same species occupying a specific area

E. The smallest unit of life capable of surviving and reproducing on its own

F. A population of all species (i.e.-all living things) occupying a given ecosystem

G. A group of similar cells that interact for a specific task

H. All the regions of the Earth that inhabit life

I. The interaction of organs to perform a common task or function

J. The smallest unit that retains an element's properties

K. Individual made of different types of cells

- +7 3. List each major theme and briefly describe.

a. Evolution

b. New properties emerge at each level in the biological hierarchy

c. Organisms interact with their environment, exchanging matter & energy

- d. Structure & function are correlated at all levels of biological organization
- e. Cells are an organism's basic units of structure & function
- f. The continuity of life is based on heritable information in the form of DNA
- g. Feedback mechanisms regulate biological systems

+2 3. Give examples of how systems biology may impact medical practice or environmental policy making.

In predicting how a particular drug or treatment may affect various aspects of the body; In predicting effects on various parts of the ecosystem as CO₂ levels climb

+2 4. Describe the pathway from DNA nucleotides to proteins.

The order of nucleotides in a DNA molecule that makes up a gene "Spells" the instructions, Rewritten in RNA, for making a protein w/ a specific function

+1 5. What is the primary model for regulation?

Negative feedback

+6 6. List and give an example of the three domains.

Bacteria → Single celled prokaryotes

Archaea → Single celled prokaryotes

Eukaryotes → All Eukaryotes

7. Describe in your own words Darwin's theory of natural selection as the mechanism of evolutionary adaptation and the origin of new species.

- +1 8. How does biology account for the unity and diversity of life?

By the process of evolution which shows both the similarities and differences of life

- +1 9. What is meant by the statement that science is a process?

Science is a way of knowing & thinking about the world around you. Science is a continual process of thinking & rethinking about the world around you

- +2 10. Contrast inductive reasoning with deductive reasoning.

Inductive reasoning derives generalizations from specific cases

Deductive reasoning predicts specific outcomes from general premises

- +2 11. Contrast quantitative data with qualitative data.

quantitative data is recorded as measurements (#'s)

qualitative data is recorded as descriptions rather than numerical measure

+2 12. How did predators "learn" to avoid coral snakes?

Since most encounters w/ coral snakes are fatal, predators didn't "learn" to avoid them. But predators w/ genes that somehow made them instinctively avoid coral snakes would have been more likely to pass on those genes

+2 13. Compare hypotheses and theories.

A Hypothesis is less broad in scope than a theory & it's a tentative explanation for a smaller set of observations. A theory can generate many testable hypothesis & is supported by a large body of evidence

Select the best answer.

+1 D 14. The core idea that makes sense of the unity and all the diversity of life is

- a. the scientific method
- b. inductive reasoning
- c. deductive reasoning
- d. evolution
- e. system biology

+1 D 15. In an experiment similar to the mimicry experiment performed by the Pfennigs, a researcher found that there were more total predator attacks on model king snakes in areas with coral snakes than in areas outside the range of coral snakes. From this the researchers conclude that

- a. the mimicry hypothesis is wrong
- b. there were more predators in the areas with coral snakes
- c. king snakes do not resemble coral snakes enough to protect them from attack
- d. the data that should be compared to draw a conclusion must include a control—a comparison with the number of attacks on model brown snakes
- e. more data must be collected before a conclusion can be drawn

+1 B 16. Why can a hypothesis never be "proven" to be true?

- a. One can never collect enough data to be 100% true.
- b. There may always be alternative hypotheses that might account for the results and that were not tested.
- c. Science is limited by our senses.
- d. Experimental error is involved in every research project.
- e. Science "evolves"; hypotheses and even theories are always changing.

+1 B 17. Which of the following is an example of positive feedback regulation

- a. The hormones insulin and glucagons regulate blood-sugar levels.
- b. In the birth of a baby, uterine contractions stimulate release of chemicals that stimulate more uterine contractions.
- c. A rise in temperature when you exercise stimulates sweating and increased blood flow to the skin.
- d. When cells have sufficient energy available, the pathways that break down sugars are turned off.
- e. A rise in CO₂ in the atmosphere correlates with increasing global temperature.

+1 D 18. In a pond sample, you find a unicellular organism that has numerous chloroplast and a whiplike flagella. In which of the following groups do you think it should be classified?

- a. Plant
- b. Animal
- c. Domain Archaea
- d. One of the proposed kingdoms of protists
- e. You cannot tell unless you see if it has a nucleus or not

+1 E 19. What is DNA?

- a. The substance of heredity
- b. A double helix made of four types of nucleotides
- c. A code for protein synthesis
- d. A component of chromosomes
- e. All of the above

+1 C 20. Which of the following represents the correct sequence in life's hierarchical levels, proceeding upwards?

- a. Organ, tissue, organ system, organism, population
- b. Organism, community, population, ecosystem, biosphere
- c. Molecule, organelle, cell, tissue, organ, organism
- d. Tissue, cell, organ, organism, community
- e. Both b & c are correct sequences

+1 E 21. Which of the following themes of biology is most related to the goals and practice of systems biology?

- a. Evolution accounts for the unity and diversity of life.
- b. Cells are an organism's basic units of structure and function.
- c. The continuity of life is based on heritable information in the form of DNA.
- d. Organisms interact with the environments, exchanging matter and energy.
- e. New properties emerge at each level in the biological hierarchy.